

REMARKS

Claims 1-18 are pending in the subject application. No claims have been indicated to be allowable.

The claims have been amended to distinguish Applicants' invention over the prior art of record. No new matter has added by the herein Amendment to the claims.

Double Patenting Rejection

Claims 1-18 stand rejected under the judicially created doctrine of obviousness type double patenting as being unpatentable over claims 1-14 of U.S. Patent No. 6,165,933. This rejection is respectfully rejected.

U.S. Patent No. 6,165,933 (the '933 patent) claims a particulate composition consisting essentially of (i) an acidic oxide support containing at least 50 weight percent alumina; (ii) 1-10 parts by weight of an alkali metal or mixtures thereof; (iii) at least 1 part by weight CeO_2 ; and, (iv) about 0.01 – 5 parts by weight palladium. Applicants' invention as now claimed is limited to a particulate composition which contains an alkaline earth metal component. Clearly, the particulate composition as claimed in the '933 patent does not contain an alkaline earth metal component. Consequently, the claims of the '933 patent are directed to a different subject matter than presently claimed in the subject application. Accordingly, this rejection is improper and should now be withdrawn.

35 USC 103

Claims 1-18 stand rejected under 35 USC 103(a) as being unpatentable over Vasalos et al (USP 4,153,535). This rejection is respectfully rejected.

Applicants' invention comprises NO_x removal compositions useful for controlling the emission of nitrogen oxides generated during the regeneration step in an FCC process while simultaneously promoting the oxidation of CO, a fluid cracking catalyst comprising said NO_x removal compositions and a method of using the NO_x removal compositions to reduce simultaneously NO_x and CO emissions during an FCC regeneration process. The composition of the invention

comprises a component which contains (i) an acidic oxide support, (ii) an alkaline earth metal, as measured in the metal oxide, (iii) a transition metal oxide having oxygen storage capability, and (iv) at least 0.1 parts by weight of palladium.

It is well known in the catalysis art, as noted in the Background of Applicants' specification, that the amount of NO_x emitted during the regeneration step of an FCC process is an "inverse function" of the amount of CO emitted from the FCC regenerator. That is, the amount of NO_x emitted would be expected to increase as the amount of CO emissions decreases, and visa versa. Additionally, when additives such as CO oxidation promoters are added to the regenerator to reduce CO emissions, there is a dramatic increase (e.g., 300%) in NO_x emitted from the FCC regenerator. Unexpectedly, however, compositions in accordance with Applicants' invention reduce NO_x emitted during an FCC regeneration step while promoting CO to CO_2 , i.e., decreasing the emission of CO.

The Vasalos et al. reference discloses a catalytic cracking catalyst and a method for the use thereof to reduce SO_x and CO emission in an FCC regenerator. The catalyst as disclosed in the Vasalos et al. reference comprising an aluminosilicate containing matrix and a "metallic reactant" which reacts with sulfur oxide. The reference discloses or teaches that the metallic reactant may be a combination of over 30 different metals, including transition metals and an alkaline earth metal.

Vasalos fails to teach or in any way suggest a composition having Applicants' specified components in Applicants' specified ranges. The Examiner has acknowledged the failure of the Vasalos et al. reference to disclose the exact amount ranges as claimed by applicants. However, the Examiner has suggested that it would have been obvious to one having ordinary skill in the art to select applicants' combination from the number of combinations of components disclosed in the Vasalos reference to determine the workable ranges of components. This premise is strongly traversed.

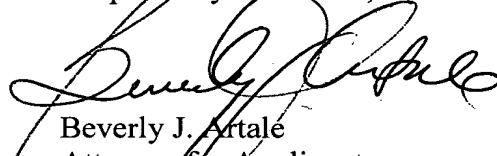
Vasalos et al. fails to teach or at all mention, a NO_x reduction composition, much less a NO_x reduction composition which simultaneously promotes the oxidation of CO. Consequently, there is no motivation or teaching to vary the amount of palladium, alkaline earth metal oxide or oxygen storage materials of the component to provide NO_x reduction while simultaneously promoting CO

oxidation. This position is especially held for several reasons. First, Vasalos fails to teach or in any way suggest to one skilled in the art to specifically combine the specified components, i.e., an acidic oxide, an alkaline earth metal, an oxygen storage and palladium, in Applicant's transition metal oxide to provide a composition useful to reduce NO_x while simultaneously promoting CO oxidation during an FCC process.

Secondly, the law is clear that where the prior art has not recognized the result-effective capability of a particular parameter resulting from Applicants' claimed range, i.e., NO_x removal simultaneously with CO oxidation, no expectation would exist that optimizing the parameter would successfully yield the desired result. In *re Anthonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977).

Consequently, for reasons as stated hereinabove, it is believed that Vasalos et al. fails to render obvious Applicants' invention as now claimed. Consequently, allowance of Claims 1-18 is respectfully requested.

Respectfully submitted,



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